

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
8 November 2001 (08.11.2001)

PCT

(10) International Publication Number
WO 01/82760 A1

(51) International Patent Classification⁷: A47J 31/46,
31/40 [CH/CH]; Hagenbuchstrasse 30c, CH-9000 St.-Gallen
(CH).

(21) International Application Number: PCT/EP01/04076 (74) Agent: THOMAS, Alain; Avenue Nestlé, 55, CH-1800 Vevey (CH).

(22) International Filing Date: 10 April 2001 (10.04.2001)

(81) Designated States (*national*): AE, AU, BR, CA, CN, CZ, HU, ID, IL, JP, MA, MX, NO, PL, SG, SI, SK, TR, UA, US.

(25) Filing Language: English

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(26) Publication Language: English

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(30) Priority Data:

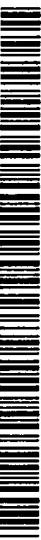
00109495.2 4 May 2000 (04.05.2000) EP

Published:

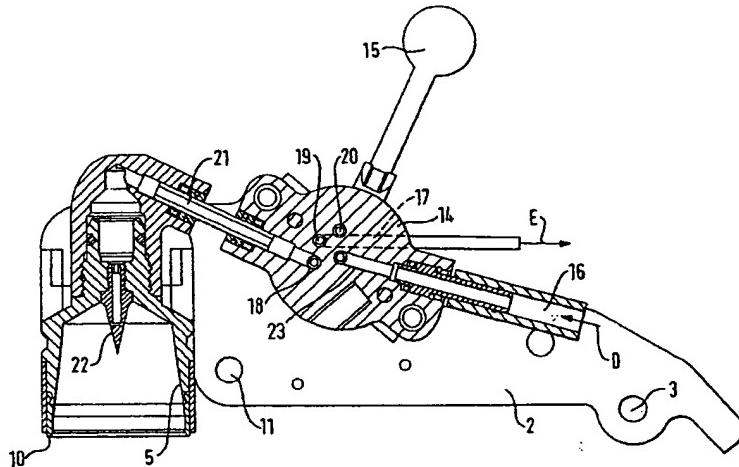
- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DEVICE FOR THE EXTRACTION OF A SUBSTANCE HAVING A MOVEABLE COMPONENT



WO 01/82760 A1



(57) Abstract: The present invention relates to a device for the extraction of a substance for the preparation of a beverage, comprising a fixed first component, a second component moveable (2) relative to the first along an axis of rotation (3) arranged at the rear of said two components, the front of each component forming a housing (5) for the substance to be extracted, and means for closing and opening the two components, said means being integral with the fixed part and with the moveable part, said device comprising, furthermore, a control (15) and a valve (14) associated with said control, which are placed on the upper part of the moveable second component (2), in such a way that said control (15) and said valve (14) are near to the housing (5) for the substance to be extracted.

- 1 -

Device for the extraction of a substance having a moveable component

The present invention relates to a device for the
5 extraction of a substance for the preparation of a beverage, comprising
- a fixed first component,
- a second component moveable relative to the first along an axis of rotation arranged at the rear of
10 said two components, the front of each component forming a housing for the substance to be extracted, and
- means for closing and opening the two components, said means being integral with the fixed part and
15 with the moveable part.

In known coffee machines for the extraction of closed cartridges, for example the device which is the subject of the patent EP 412,570, there is no moveable part, so
20 that the machine is in one piece and the water which stands in order to arrive at the housing of the substance to be extracted is in a hot environment, to be precise at a temperature of the order of 90°C. There is therefore no risk that the temperature of the water
25 will fall. By contrast, in a machine with a moveable component, such as, for example, Patent Application WO 94/02059 and Patent Application EP 99117107.5 of 31 August 1999, the heating body of the machine is not in proximity to the housing for the substance to be
30 extracted. The result of this is that, if the control for starting the machine and the valve integrated in the machine are placed at some distance from the housing for the substance to be extracted, there is a certain amount of standing water. In fact, the valve
35 makes it possible for the heating body to empty as far as the valve, but not beyond it. The connecting pipe between the housing for the substance to be extracted and the valve remains full of water, said water in time

- 2 -

becoming cold. The more time elapses between two successive coffee preparations, the more the temperature of the water will fall and the greater will be the effect on the temperature of the coffee prepared 5 afterwards.

The object of the present invention is, therefore, to reduce the amount of standing water, so that, from the moment when the machine is put into operation, there is 10 only a slight effect on the temperature of the prepared coffee.

The present invention relates to a device for the extraction of a substance for the preparation of a 15 beverage according to the preamble of Claim 1, in which said device comprises a control and a valve associated with said control, which are placed on the upper part of the moveable second component, in such a way that said control and said valve are near to the housing for 20 the substance to be extracted.

The amount of standing water is thereby reduced significantly. For example, without the arrangement according to the invention, a volume of standing water 25 of the order of 10-15 ml occurs, whereas, according to the invention, the volume of standing water is reduced to 1-3 ml. This means that, for a coffee volume of the order of 40-100 ml, even after relatively long intermission, the first coffee after said intermission 30 has the same temperature as the others made by means of the device according to the invention. This is certainly not the case in the conventional system which may provide a coffee having a temperature 5°C lower because of the high volume of standing water.

35

The means used for closing and opening the two components may be of any type, in particular those

- 3 -

described in the abovementioned European Patent Application number 99117107.5.

The control of the system acts directly on the direction assumed by the water, that is to say on the valve for distributing the water. In the device according to the invention, the control and the associated valve have a position of rest, a beverage preparation position and a steam formation position. In the position of rest, the residual water is rejected: it goes without saying that this rejection takes place only at the moment when the control is switched into the position of rest, that is to say at the end of extraction, for example of a coffee cartridge. In the beverage preparation position, the water coming from the heating body passes directly into the housing for the substance to be extracted, for a duration necessary for extracting the cartridge. As mentioned above, at the end of extraction, there is a return to the position of rest. The last position is the steam generation position, for example in order to heat the milk during the preparation of a cappuccino coffee.

The type of valve which can be used according to the invention is not critical. A ceramic valve is preferably used.

The device according to the invention is normally actuated manually. It is also possible for the valve provided to be a solenoid valve controlled by electronics making it possible to stop the coffee at a preprogrammed volume.

The rest of the description is made with reference to the drawings in which:

Figure 1 shows in perspective a device for the preparation of a beverage having a moveable component,

Figure 2 is a diagrammatic illustration of the device according to the invention at rest, and

- 5 Figure 3 is a diagrammatic illustration of the device according to the invention in the coffee preparation position.

The device for beverage preparation comprises:

- 10 - a fixed first component (1),
- a second component (2) moveable relative to the first along an axis of rotation (3) arranged at the rear of said two components, the front of each component (1, 2) forming a housing (4) and (5), respectively,
15 for the substance to be extracted,
- said device comprising furthermore, means for closing and opening the two components, said means comprising a two-armed closing lever (6) and two pull rods (7).
- 20 This device and also its functioning are already described in the abovementioned European patent application.

A closing lever (6) comprises the gripping part (8) and
25 the actual lever part which has a virtually 90° bend. The pull rod may be straight or, as in the figure, have curved ends. The housing (4) comprises a peripheral rim (9) and the housing (5) a peripheral rim (10).

- 30 The two arms of the closing lever (6) are fastened rotatably along a first axis (11) on either side of the second component (2) and the pull rods (7) are fastened rotatably along a second axis (12) on either side of the first component (1). Those two ends of the two arms
35 of the closing lever which are opposite the gripping part (8) and the two ends of the pull rods (7) are integral with one another along a third moveable axis (13), in such a way that the closing lever cooperates

- 5 -

with the rods in order to ensure the closing and opening of the device according to the invention.

The consumer arranges in the housing (4) a capsule or
5 cartridge to be extracted (not illustrated). He then
pulls the gripping part (8) of the closing lever (6)
forwards in the direction of the arrow A, so as to
cause said lever to rotate about its axis (11), this
then driving the pull rod (7) upwards along the axis
10 (13) and causing the moveable part (2) to descend
(arrow B) towards the fixed part (1). The closing
position is assumed when the closing lever is
substantially in a horizontal position and the pull
rods are in a vertical position. At this moment, the
15 peripheral rims (9, 10) of the housings (4, 5) face one
another and must ensure that the device has a high
degree of leak-tightness.

Figures 2 and 3 show the control device which is not
20 illustrated in Figure 1: this device is placed in the
zone C of Figure 1 on the moveable part (2). The
identical elements have been given the same reference
numerals. The moveable part (2) comprises a housing (5)
for the cartridge to be extracted and a peripheral rim
25 (10). The valve (14) makes it possible to direct the
hot water arriving via the conduit (16) either for
rejection via the conduit (17) or towards the cartridge
via the conduit (21) or for steam generation. This
operation is made possible by the control (15): for
30 this purpose, the control (15) is integral with a disc
comprising a switching slot, and this disc, depending
on its position, puts the main hot-water intake (23) in
communication either with the outlet (19) for rejection
or with the outlet (18) towards the cartridge to be
35 extracted or with the outlet (20) for the generation of
steam.

- 6 -

The device functions as follows: a cartridge is placed in the housing (4) and the user closes the moveable part (2) by lowering it by means of the gripping part (8). At rest, the device is in the position shown in
5 Figure 2: the cartridge is in the housing (5) and the needle (22) pierces the top of said cartridge. The user then pulls the control (15) towards him, thereby putting the device into the position shown in Figure 3: the hot water passes via the conduits (16) and (21) and
10 arrives at the needle (22) for extracting the cartridge. This extraction is known and described in Patent Application WO 94/02059: there is therefore no need to describe it again, since this extraction is not the subject of the present invention. The coffee flows
15 into a cup arranged underneath the housing (4). When the amount of coffee in the cup is considered sufficient, the user pushes back the control (15) in order to return to the position shown in Figure 2: the residual water is then rejected via the conduit (17).

20

As mentioned above, the water which stands at the moment when the machine is not in use is only that which is in the conduit (21), thus corresponding to a volume of the order of 1-3 ml. This small amount does
25 not have a great influence on the final temperature of the coffee obtained, that is to say it does not appreciably lower the temperature of the complete cup.

Claims

1. Device for the extraction of a substance for the preparation of a beverage, comprising:
 - 5 - a fixed first component,
 - a second component moveable relative to the first along an axis of rotation arranged at the rear of said two components, the front of each component forming a housing for the substance to be extracted, and
 - means for closing and opening the two components, said means being integral with the fixed part and with the moveable part,
- 15 said device being characterized in that it comprises a control and a valve associated with said control, which are placed on the upper part of the moveable second component, in such a way that said control and said valve are near to the housing for the substance to be extracted.
- 20
- 25 2. Device according to Claim 1, characterized in that the control and the associated valve have a position of rest, a beverage preparation position and a steam formation position.
3. Device according to one of Claims 1 and 2, characterized in that the valve is a ceramic valve.

1/3

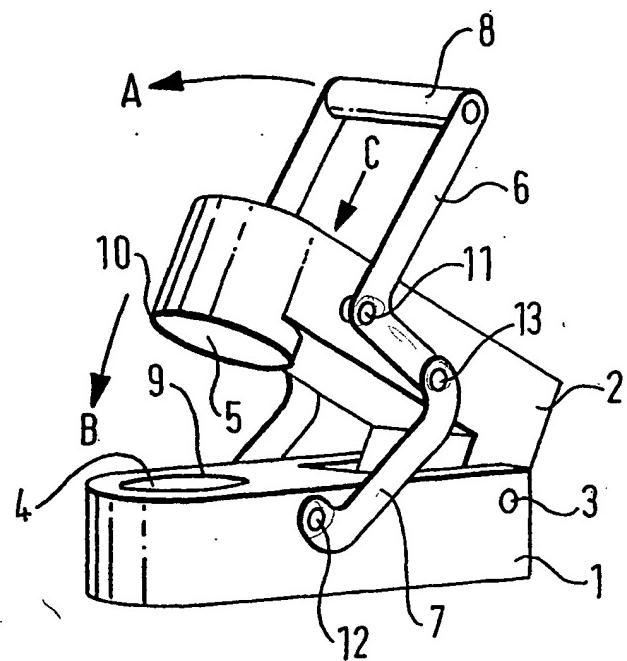
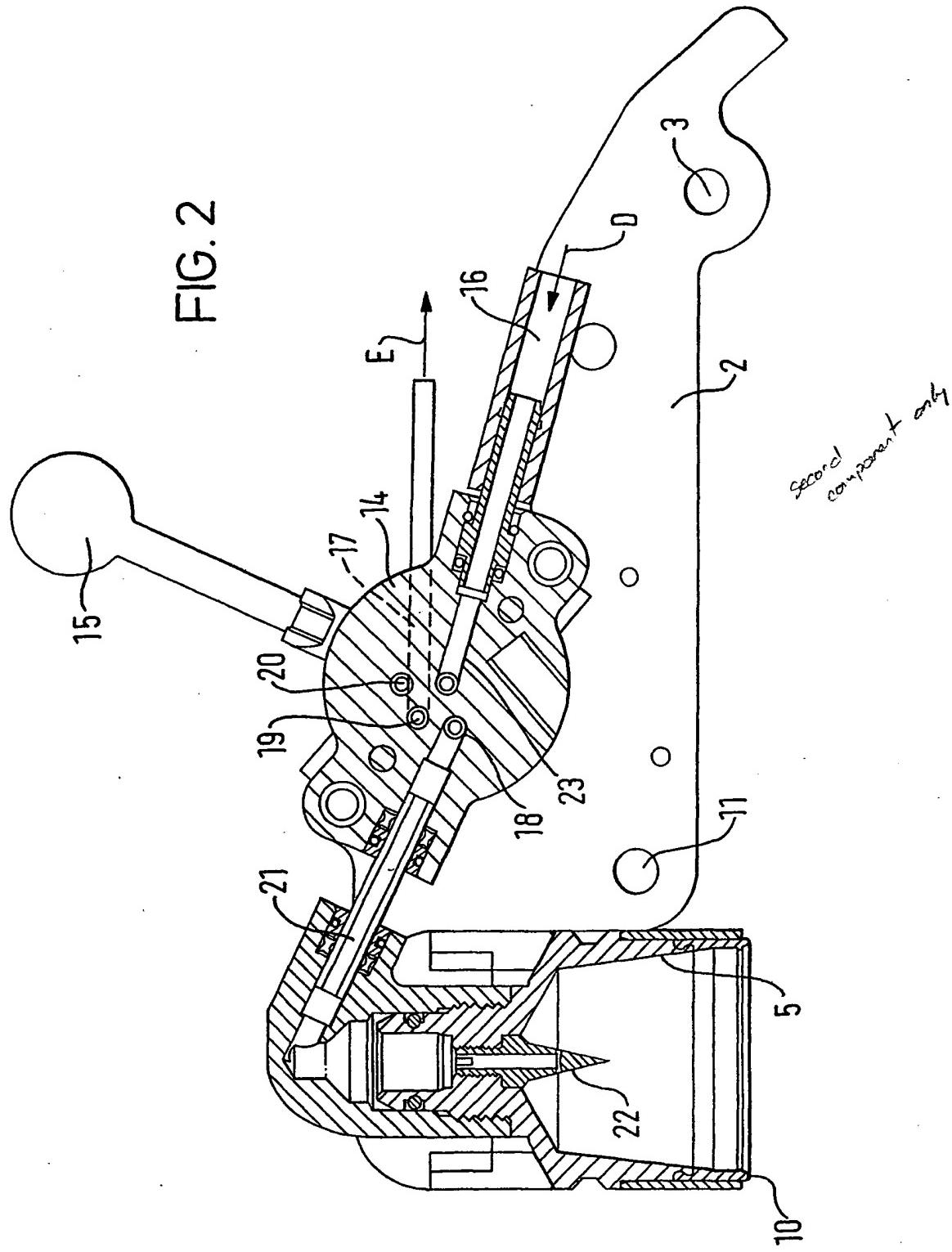


FIG. 1

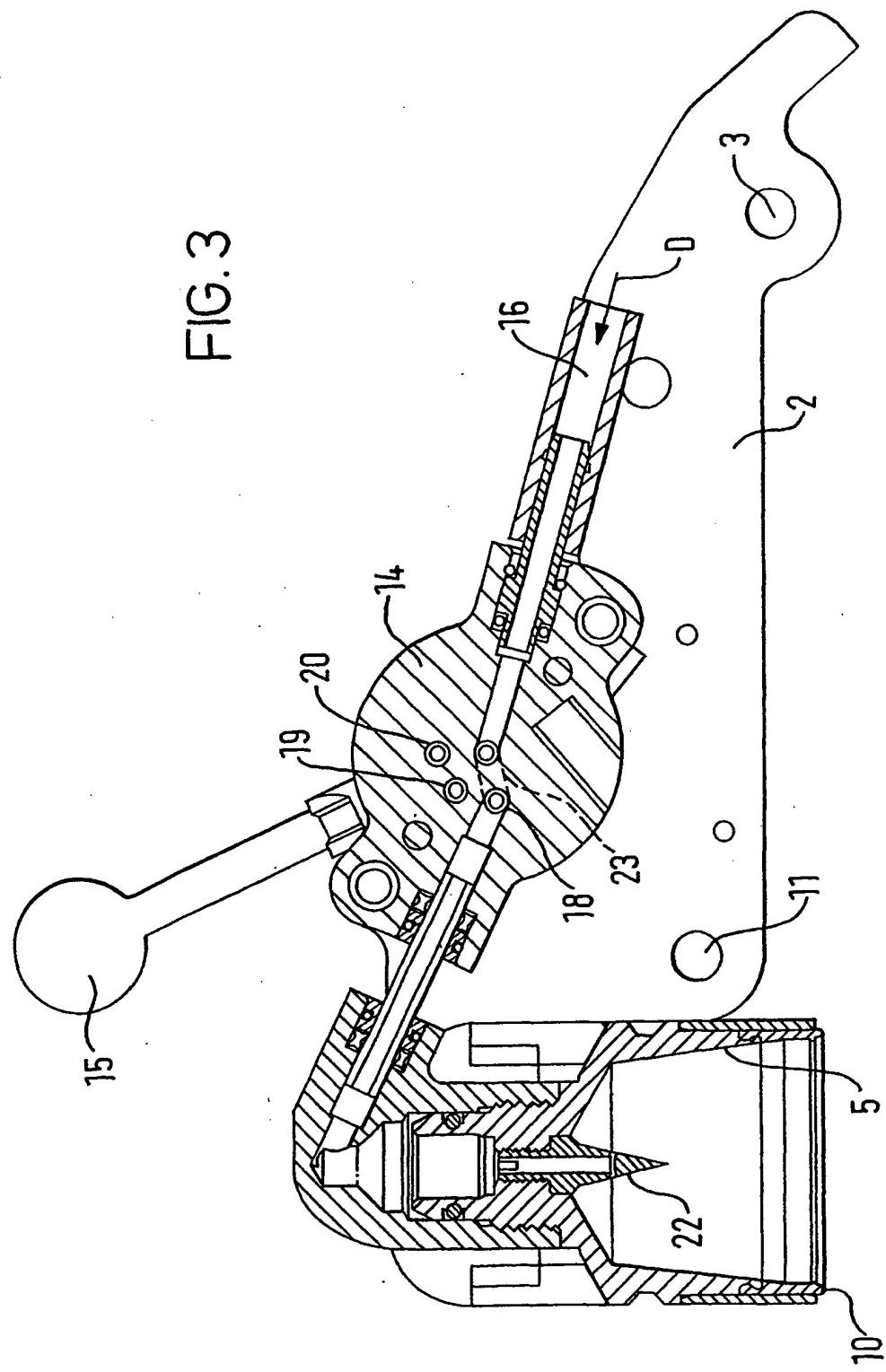
2/3

FIG. 2



3/3

FIG. 3



INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 01/04076

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 A47J31/46 A47J31/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 14 04 127 A (RUDD-MELIKIAN INC) 24 October 1968 (1968-10-24) page 3, paragraph 3 -page 8, paragraph 1; figure 1	1-3
Y	US 4 947 738 A (EUGSTER) 14 August 1990 (1990-08-14) column 3, line 53 -column 6, line 15; figures 2,3	1-3
A	EP 0 862 882 A (C.M.A. S.P.A.) 9 September 1998 (1998-09-09) column 1, line 57 -column 3, line 21; figures 1,3	1

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the International filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the International filing date but later than the priority date claimed

"T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

3 September 2001

10/09/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5018 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Bodart, P

INTERNATIONAL SEARCH REPORT

INFORMATION ON PATENT FAMILY MEMBERS

International Application No

PCT/EP 01/04076

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
DE 1404127 A	24-10-1968	CH	362816 A	30-06-1962
		CH	365323 A	31-10-1962
		FI	41080 B	30-04-1969
		GB	939814 A	16-10-1963
		GB	939813 A	16-10-1963
		NL	6600997 A	25-04-1966
US 4947738 A	14-08-1990	EP	0307497 A	22-03-1989
		DE	8717864 U	29-11-1990
EP 862882 A	09-09-1998	IT	MI970222 A	05-08-1998
		BR	9800558 A	31-08-1999
		CA	2228882 A	05-08-1998
		US	5921168 A	13-07-1999